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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/678,836	10/04/2000	Sang-Hun Sung	P-123	4867

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EXAMINER
MEW, KEVIN D

ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/678,836

Applicant(s)

SUNG ET AL.

Examiner

Kevin Mew

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9, 11, 13, 14, 16, 18, 19 and 21-23 is/are rejected.
- 7) ☒ Claim(s) 6-7, 10, 12, 15, 17, 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Detailed Action

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference character "ST13". A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference character "ST3" in last line of page 9 of the specification. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 3 is objected to because of the following informalities:

The term "the" in "the plurality of taps" should be replaced with "a." Appropriate correction is required.

Claims 1 and 4 are objected to because of the following informalities:

The term "Psuedo" is misspelled. It should be replaced with the correct spelling "Pseudo" instead.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2, 3, 5, 8, 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the entire taps" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the same" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the same" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitations "the offset" and "the synchronization point of time" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "the same" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitations "the position" and "the synchronization point of time" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 3-4, 8-9, 11, 14, 16, 18-19, 21-22** are rejected under 35 U.S.C. 102(b) as being anticipated by the admitted prior art, Masui (USP 6,570,865).

Regarding claim 1, Masui discloses an apparatus (**a communication system that comprises a plurality of base stations and a plurality of mobile terminals**, see Fig. 1) for acquiring multi-user signal synchronization (**facilitating fast synchronization of spreading codes between each radio terminal and a base station**, see lines 66-67, col. 6 and line 1, col. 7) in a CDMA system (**system for CDMA packet transmission**, see lines 4-7, col. 6 and Fig. 4), comprising:

a plurality of CDMA transmitters (**a plurality of base stations**, see Fig. 1), which generate pilot signals using different Pseudo Noise (PN) seeds (**the base station spreads the pilot signal with a spreading code PN**, see lines 1-2, col. 7) and align the generated pilot signals to transmit them within a prescribed time (**the base station spreads the pilot signal with a spreading code PN having a suitable period, and continuously transmits the spread spectrum pilot signal on a pilot channel**, see lines 1-5, col. 7) from a synchronization point of time (**assigned transmission timing**, see 34-42, col. 7; note that pilot signal is transmitted as the reply packet, see lines 14-15, col. 7); and

a CDMA receiver (a **CDMA transceiver**, see element 50, Fig. 6) comprising a single matched filter (**short code matched filter**, see 70a, Fig. 7), to acquire a synchronization of signals transmitted from the plurality of CDMA transmitters (**realizing fast synchronization**) in one frame period (**the period of a PN sequence**, see lines 53-57, col. 8) by varying a tap coefficient at a certain interval in the frame period (a **plurality of coefficients, one in each tap, arranged on the input side of the delay element at the first stage and on the output side of the respective delay elements**, see lines 9-18, col. 9 and Fig. 8A).

Regarding claims 3 & 14, Masui discloses the apparatus of claim 1, wherein the matched filter comprises:

a plurality of taps (see element 402, Fig. 5) to delay pilot signals transmitted from the plurality of CDMA transmitters for prescribed time periods before outputting the pilot signals (see lines 9-18, col. 9 and Fig. 8A);

a coefficient generator (see coefficients a_1 - a_n , Fig. 8A; it is inherent that these coefficients are generated by a coefficient generator) to generate coefficients corresponding to the PN seeds (respective chip values of the PN sequence a_1 - a_n for the reservation channel are previously set in the respective coefficient multipliers as coefficients, see lines 26-30, col. 9) used in the plurality of CDMA transmitters and output the pilot signal at a prescribed interval in a frame period (one period portion of the PN sequence simultaneously appears at the plurality of taps at the time the top chip of an inputted signal reaches the rightmost tap, see lines 24-27, col. 9);

a plurality of multipliers to multiply signals outputted from the plurality of taps by corresponding coefficients outputted by the coefficient generator (see lines 27-30, col. 9 and Fig. 8A); and

a summer to sum the outputs of the plurality of multipliers, wherein the summed value is a correlation value (accumulator, see lines 30-32, col. 9 and element 73, Fig. 8A).

Regarding claim 4, Masui discloses a method for acquiring multi-user signal synchronization in a CDMA receiver (CDMA receiver receives the spread spectrum communication signal and synchronizes receiver bit timing and transmitter bit timing, see lines 1-4, page 8 and line 2, abstract), comprising:

receiving aligned pilot signals having different Pseudo Noise (PN) seeds from a plurality of CDMA transmitters (**each base station spreads the pilot signal with a spreading code PN**, see lines 1-2, col. 7), the aligned pilot signals having been transmitted from the plurality of CDMA transmitters in one frame period (**the base station spreads the pilot signal with a spreading code PN having a suitable period, and continuously transmits the spread spectrum pilot signal on a pilot channel**, see lines 1-5, col. 7); and

acquiring synchronization of transmitted signals by dynamically updating a tap coefficient at a certain interval in the frame period (**a plurality of coefficients, one in each tap, arranged on the input side of the delay element at the first stage and on the output side of the respective delay elements**, see lines 9-18, col. 9 and Fig. 8A) and correlating it with the pilot signals (**a total sum of the results of multiplications of respective tap outputs by the respective coefficients is calculated by an accumulator**

and the accumulation result is outputted as a correlation value, see lines 30-32, col. 9 and Fig. 8A)

Regarding claim 8, Masui discloses a method for acquiring multi-user signal synchronization in a CDMA system, comprising:

storing PN seeds that are equal to PN seeds used in a plurality of CDMA transmitters (see lines 27-30, col. 9 and PN code a_1 - a_n , Fig. 8A);

generating a tap coefficient corresponding to the plurality of stored PN seeds **(respective chip values of the PN sequence a_1 - a_n for the reservation channel are previously set in the respective coefficient multipliers as coefficients, see lines 26-30, col. 9) and updating the same at a prescribed time interval in a frame period (one period portion of the PN sequence simultaneously appears at the plurality of taps at the time the top chip of an inputted signal reaches the rightmost tap, see lines 24-27, col. 9); and**

acquiring signal synchronization of the plurality of CDMA transmitters in one frame by correlating signals from the CDMA transmitters with the updated tap coefficient (see lines 30-37, col. 9).

Regarding claim 9, Masui discloses the method of claim 8, wherein the prescribed time interval in the frame period (**delay time of each delay element**) is represented as M/N msec, where the length of one frame is M msec and the number of CDMA transmitters in the plurality of CDMA transmitters is N (**chip width of a PN sequence, see lines 20-24, col. 9**).

Regarding claim 11, Masui discloses the method of claim 8, wherein synchronization of signals of the corresponding CDMA transmitter is acquired and the position from the synchronization point of time is outputted when the signal from the CDMA transmitters transmitted at a certain time interval in the frame period is identical to the tap coefficient updated at the prescribed time interval in the frame period (see lines 32-37, col. 9).

Regarding claims 13 & 23, the apparatus of claim 3, further comprising a plurality of demodulators to demodulate signals from the plurality of CDMA transmitters after being synchronized in the matched filter (it is inherent that demodulators are used on the receiver to demodulate signals after being synchronized in the matched filter).

Regarding claim 16, Masui discloses the system of claim 14, wherein the delay circuit comprises a plurality of taps configured to sequentially delay each of the pilot signals by a prescribed delay time (see lines 10-12, col. 9 and element 71, Fig. 8A).

Regarding claim 18, the system of claim 14, wherein the delay circuit comprises a plurality of taps configured to sequentially delay each of the pilot signals by a prescribed delay time (see lines 20-27, col. 9 and Fig. 8A).

Regarding claim 19, Masui discloses the method of claim 4, wherein the aligned pilot signals are transmitted within a prescribed time from a synchronization point of time

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(sets a time slot in synchronism with the base station on the reply channel, see lines 8-10, col. 7).

Regarding claim 21, Masui discloses the method of claim 4, wherein the tap coefficient corresponds to the PN seeds (see lines 27-30, col. 9).

Regarding claim 22, Masui discloses the method of claim 8, wherein the correlating is performed by a single matched filter (see lines 10-39, col. 9, and element 70a, Fig. 8A).

Allowable Subject Matter

5. Claims 2, 5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

6. Claims 6-7, 10, 12, 15, 17, 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 2, Masui discloses the apparatus of claim 1, wherein the prescribed time of alignment of the plurality of CDMA transmitters is greater than, zero, and less than the difference of a dividend of a period of one frame divided by the number of CDMA

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transmitters minus a time taken for loading the transmitted signals to the entire taps of the matched filter.

In claim 5, acquiring synchronization of the transmitted signals and outputting position data in which the offset from the synchronization point of time is transferred to a corresponding demodulator, if the signal from one CDMA transmitter among signals received from the plurality of CDMA transmitters equals the loaded coefficient.

In claim 10, the method of claim 8, wherein the generated tap coefficient is loaded in a random order at the prescribed time interval in the frame period regardless of the order of users using the corresponding PN seed.

In claim 12, the method of claim 11, wherein there is no offset in the position when synchronization is acquired by using the first loaded coefficient from the synchronization point of time, and the time taken to load the coefficient from the synchronization point of time is represented as the offset when synchronization is acquired by using subsequent loaded coefficients.

In claim 17, the system of claim 14, wherein the received pilot signals are pre-aligned.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure with respect to acquiring multi-user signal synchronization in a CDMA system.

USP 6,516,022 to Ozluturk et al.

USP 6,611,512 to Burns

USP 6,560,272 to Komatsu

USP 6,385,232 to Terashima

USP 6,343,094 to Yamamoto

USP 6,289,041 to Krasner

USP 6,275,545 to Suzuki

USP 6,141,337 to Uta et al.

USP 6,658,042 to Tran et al.

USP 6,470,000 to Burns et al.

USP 6,259,687 to Lomp et al.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 703-305-5300.

The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 703-305-4366. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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